DOCUMENT RESUME

ED 141 217 SO 010 053

TITLE Implementing Energy Education in Florida's High Schools: A Two-Week Credit Institute for Teachers in South Florida. Final Report, Volume I.

INSTITUTION Florida State Univ., Tallahassee. Environmental Education Project.

SPONS AGENCY Energy Research and Development Administration, Washington, D.C.

PUB DATE 77

NOTE 52p.

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage.

DESCRIPTORS *Curriculum Development; *Energy; Energy Conservation; *Environmental Education; Environmental Influences; *Inservice Teacher Education; Institutes (Training Programs); Interdisciplinary Approach; Learning Activities; Professional Training; Secondary Education; Skill Development; Teacher Improvement; Teacher Workshops; Teaching Skills; *Teaching Techniques

ABSTRACT

A 1977 inservice teacher training workshop in implementing energy education in Florida high schools is described. Designed for secondary teachers of science, social studies, vocational education, environmental studies, and home economics, the two-week workshop provided specific content instruction and teaching methods related to energy and energy conservation. Thirty-five teachers were given an overview of energy, environment, economics, and ethics through investigation of topics such as nuclear power, alternative energy sources, biological energy systems, and electrical power generation. Speakers included environmental experts from state and local government, universities, private industry, and citizens' organizations. Participants were introduced to curriculum models and given the opportunity to develop their own energy education units. It was recommended that future institutes include more equal representation of teachers from all target disciplines, increased urban participation, flexibility of workshop schedules, and an advance mailing of readings to each participant. The document includes a list of participants, a daily schedule of activities, a media and materials list, and evaluation forms. (Author/DB)

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FINAL REPORT

Volume I

United States Energy Research and Development Administration
400 First Street, N.W.
Washington, D.C. 20545

IMPLEMENTING ENERGY EDUCATION IN FLORIDA'S HIGH SCHOOLS:

A Two-Week Credit Institute for Teachers in South Florida

Project Director: Rodney F. Allen, Associate Professor
Science and Human Affairs Program
Florida State University
Tallahassee, Florida 32306
(904) 644-5769

Contract Dates: March 1, 1977 - September 1, 1977

Institute Dates: April 25-29, 1977
May 5-7, 1977
May 12-14, 1977

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1. INTRODUCTION

Education in Florida's public schools is developing a national reputation for highly innovative and enlightened programs that uniquely respond to public interest. Schools in Florida reflect the values, norms and concerns of current society. The responsiveness of the Florida system is largely due to the highly skilled classroom teachers employed by the system and the flexibility of the curriculum.

Recent public awareness of environmental and other energy related problems led to the establishment of the Florida Office of Environmental Education within the Department of Education. This office is strategically located directly on the Commissioner of Education's staff and enjoys a unique prominence in state educational structures. The field staff of this office are in regular contact with teachers and principals throughout the 67 school districts in Florida. Each district and each school within that district has a person responsible for implementing environmental education. This structure of field coordinator, district contact and school resource person provides the mechanism for implementing energy education programs in Florida.

Increasingly, the programs of the Florida Office of Environmental Education are complemented by educational interests developed by the Florida Energy Office. Personnel in the Florida Energy Office have used the resources available to them in programming for adults and, as increased resources have become available, personnel have assisted school teachers and youth workers.

The Environmental Education Project at Florida State University has worked closely with the Florida Office of Environmental Education to provide a series of inservice teacher training workshops throughout Florida. These workshops deal primarily with specific content areas such as beach ecology or specific implementation strategies such as developing valuing skills. Last year over 100 such workshops were conducted in Florida.

A. The Need

A frequent need expressed by teachers was for specific content instruction in the realm of energy education and ways to teach energy education in its broadest scope. Teachers expressed the desire for institutes that would open a new content area for them but within the subject matter they currently teach. Science teachers wanted to learn more about the technology of biological and physical energy systems; home economics teachers expressed interest in exploring the many dimensions of energy use and conservation in areas that relate to family life and personal values.

This workshop developed from a need by Florida teachers to better understand energy, energy conservation, and lifestyles.

B. Scope and Objectives

This energy institute was comprehensive. It dealt with both factual matter such as energy technology and conservation, and with the teaching methodology needed to put energy education into existing school curriculum in several appropriate disciplines.

Objective One: To conduct workshops for secondary school teachers of science, social studies, vocational education, environmental studies or home economics. Approximately 35 teachers attended the workshop.

Objective Two: To introduce workshop participants to a variety of broadly based energy related issues including nuclear power, alternative energy sources, biological energy systems, and electrical power generation. The workshop provided as much factual information as possible and explored alternatives in terms of social and environmental cost/benefits.

Objective Three: Workshop participants will be trained in energy education techniques appropriate for their disciplines. All too often, workshops and short courses educate teachers, but fail to give them the necessary skills or instructional tools to educate their students. One full week of this workshop will be devoted to teaching techniques.

C. Selection of Workshop Participants

The regional consultants of the State Office of Environmental Education, in conjunction with the State Director and environmental education contact persons in local school districts, where responsible for identifying participants for the institute. They selected from secondary school teachers of science, social studies, environmental education, vocational education, and home economics, employing the following criteria:

a) support of teachers' school principals and school district administrative staff;

b) distribution so as to involve as many schools as possible in an area;

c) distribution to achieve involvement on a sex, racial, ethnic balance; and

d) distribution to achieve a balance in curriculum areas (science, social studies, vocational education, environmental education, and home economics.)

D. The Institute Format

The first week of the credit institute dealt extensively with energy resources and the agencies that are responsible for their development and distribution. In addition, participants were given an overview of the relationship between the four E's: energy, environment, economics and ethics during the first week. This overview served as a useful frame of reference throughout the entire workshop.

The second and third weekend sessions of the workshop were devoted to developing the materials and skills needed to transmit the newly developed knowledge of the teacher-participants. Participants were divided into functional groups and then sub-divided into working groups. Various curriculum models and model lessons were demonstrated and the sub-groups were allowed time and opportunity to develop a format and model lesson. During the last

part of the second week, the sub-groups were allowed to work independently. Specific meetings functioned merely as feedback sessions, enabling the sub-groups to obtain comments and exchange information with all workshop participants. Volume II of this report contains the participant-developed energy education units.

E. Schedule of Project Activities - 1977

March April May June July

---Notice of Funding
---Plan with local school personnel
---Identify sources of materials, films
---Begin recruiting teachers in selected areas
---Order workshop materials, identify consultants
---Notify successful applicants
---Finalize program, distribute program
---Content portion of workshop
---Implementation portion of workshop
---Final Report (Volume I)
---Final Report (Volume II)
---Final Fiscal Report

F. Cooperating Agencies

It is impossible to identify all the local, state and federal agencies that helped make this Institute a success. School districts distributed application forms and information about the workshop, various agencies supplied materials and films, others furnished speakers and panelists.

Dr. Carlos Warren, Director of the Florida Energy Office, generously offered his own time and a great deal of staff time to help facilitate the workshop and make it function smoothly.

The Florida Office of Environmental Education, Department of Education, provided the key mechanism to recruit participants and ensure the quality of those selected. C. Richard Tillis, Director, and Frank Kapp, Regional Coordinator, made valuable contributions long before the first workshop session.

G. Workshop Publicity

Upon receipt of the funding notice, the Institute staff developed the specific plans for the institute with local school officials and distributed announcements to teachers in those counties and to organizational newsletters (Florida Audubon Society, Florida Council for the Social Studies, etc.). These announcements were complemented by personal contacts by regional consultants of the Florida Office of Environmental Education and letters from the Institute staff to educational leaders in those county school systems.

Application forms were designed, printed and distributed along with a second mailing of the announcement flyers. This distribution was accomplished through county in-service education directors, school principals, and environmental education center directors.

2. LIST OF PARTICIPANTS

Eldon Achberger 623 Barber Avenue Lake Worth, Florida 33461	SS# 167-36-9397	Palm Beach County
John W. Blake, Jr. 1027 Belmont Place West Palm Beach, Florida 33405	SS# 265-22-5082	Palm Beach County
Rosalind A. Blake 1027 Belmont Place West Palm Beach, Florida 33405	SS# 261-34-3497	Palm Beach County
Don Chenicek Palm Beach County Schools Belevedere Road West Palm Beach, Florida 33405		Palm Beach County
Peggy H. Cook 1001 36th Street, Apt. 172-N West Palm Beach, Florida 33407	SS# 252-74-9832	Palm Beach County
Carey L. Culpepper 1028 James Road Lantana, Florida 33462	SS# 262-94-8259	Palm Beach County
Dennis E. Davis 1178 Zill Street West Palm Beach, Florida 33406	SS# 269-32-0584	Palm Beach County
Anita L. DeCan 711 North B Street Lake Worth, Florida 33460	SS# 375-36-4216	Palm Beach County
Susan Dougherty 1504 NE 24th Street Ext. Jensen Beach, Florida 33457	SS# 188-32-2086	Martin County
Graham G. Frost 103 Pintail Court Royal Palm Beach, Florida 33411	SS# 316-60-1099	Palm Beach County
James B. Fulton P.O. Box 111 Delray Beach, Florida 33444	SS# 266-74-8100	Palm Beach County
Josephine H. Gross 592 Sioux Road Lantana, Florida 33462	SS# 263-86-9023	Palm Beach County
Martin Guttmann 22605 SW 66th Avenue #306 C Boca Raton, Florida 33433	SS# 266-15-0985	Palm Beach County

Wayne T. Hammer 1101 South K Street Apt. #2 Lake Worth, Florida 33460	SS# 262-08-3712	Palm Beach County
Stanley Hinden 5900 SW 8th Street Plantation, Florida 33317	SS# 102-22-1982	Broward County
Carol Houck 5261 SW 8th Court Plantation, Florida 33317	SS# 352-30-5397	Broward County
Irma A. Jarvis 276 Cherry Street Palm Beach Gardens, Florida 33410	SS# 109-22-6144	Palm Beach County
Anatole B. Kowalchuk 1403 Beta Circle West Palm Beach, Florida 33406	SS# 266-32-5760	Palm Beach County
William E. LaCroix 12907 Inshore Drive Lake Park, Florida 33410	SS# 113-14-7220	Palm Beach County
William B. Morehead 720 Snowden Drive Lake Worth, Florida 33461	SS# 262-46-0340	Palm Beach County
Milo W. Mosser, Jr. 148 Date Palm Lake Park, Florida 33403	SS# 156-16-4392	Palm Beach County
Gordon C. Nicholas 195 NW 3rd Avenue South South Bay, Florida 33493	SS# 266-24-5066	Palm Beach County
Frank Pittman Box 1064 Jensen Beach, Florida 33457	SS# 254-62-3183	Martin County
David J. Reilly 107 Edwards Lane Palm Beach Shores, Florida 33404	SS# 305-56-6814	Palm Beach County
Dolores O. Robinson 418 South Coconut Road Pahokee, Florida 33476	SS# 261-94-0074	Palm Beach County
Craig A. Schuett 9295 SE Athena Avenue Hobe Sound, Florida 33455	SS# 469-58-5460	Palm Beach County

Malka D. Shaw 621 SE 15th Avenue #B-404 Boynton Beach, Florida 33435	SS# 248-80-7520	Palm Beach County
Joan L. Sineath 3912 North Shore Drive West Palm Beach, Florida 33407	SS# 260-50-8904	Palm Beach County
Joe V. Skinner 74 Tortuga Road Palm Springs, Florida 33461	SS# 267-60-8586	Palm Beach County
Charles E. Smith 4135 Narcissus Avenue Lake Worth, Florida 33461	SS# 263-80-7512	Palm Beach County
Virginia Smith 3940 Australian Court West Palm Beach, Florida 33407	SS# 256-70-4034	Palm Beach County
Lester P. Sokolowski 950 NE 3rd Avenue Boca Raton, Florida 33432	SS# 262-66-3692	Palm Beach County
Earley L. Vessell 1462 Ninth Street West Palm Beach, Florida 33402	SS# 428-64-8532	Palm Beach County
Donald Westfall 810 South 14th Street Lantana, Florida 33462	SS# 374-40-8089	Palm Beach County
Randolph Robert Wohlert 17365 96th Way Jupiter, Florida 33458	SS# 262-04-7851	Palm Beach County

REPORT ON PROTECTED GROUPS

TOTAL PARTICIPANTS	Male	Female	N
	24	11	35
Blacks	1	4	5
Spanish-speaking	0	1	1
Indians (Native Americans)	0	1	1
Oriental	0	0	0

3. DAILY SCHEDULE OF ACTIVITIES

MONDAY * April 25, 1977

Coffee**

Welcome, C. Richard Tillis, Director, Florida Office of Environmental Education

Frank Kapp, Consultant, Florida Office of Environmental Education

Don Chenicek, Energy Management Specialist, Palm Beach County Schools

Institute Overview and Objectives for Energy Education

David LaHart, Florida State University

Concurrent Sessions: 10:00 to 12:00

Group A: Citizens' Energy Workshop

Jerry Ventre, Florida Technological University

Group B: The National Energy Outlook

Rod Allen, Florida State University

Brown Bag Lunch: 12:00 to 12:45

Concurrent Sessions: 12:45 to 2:45

Group A: The National Energy Outlook

Rod Allen

Group B: Citizens' Energy Workshop

Jerry Ventre

* All sessions will begin at 8:30 AM and close at 3:00 PM.
** Bring your own mug, we will chip in for coffee and tea, as the participants prefer.

TUESDAY, April 26, 1977

The Florida Energy Outlook

Carlos Warren, Director, The Florida Energy Office

Rosalyn Tillis, Education Consultant, The Florida Energy Office

Oil, Natural Gas, and Coal in Florida's Energy Picture

Carlos Warren

Dialogue

Brown Bag Lunch: 11:30 to 12:15

Energy Flow in Natural and Human Systems

Arthur R. Marshall

Dialogue

WEDNESDAY, April 27, 1977

Nuclear Energy: Concepts, Processes and Issues -- A Panel

Moderator - David LaHart

Raymond Sheline, Florida State University

Robert Touchton, Westinghouse Electric, Pittsburgh

J.H. "Jack" Francis, Florida Power and Light Company

David Anthony, University of Florida

Brown Bag Lunch: 12:00 to 12:45

Small Group Discussions with Panelists

THURSDAY, April 28, 1977

Solar Energy: Concepts, Processes, and Issues -- A Panel

Del Ward, Florida Solar Energy Center, Cape Canaveral

Dr. Sheila Ronis, Museum of Atomic Energy, Oak Ridge, Tennessee

Robert Pozzo, Florida Energy Office

Dialogue

Brown Bag Lunch: 12 to 12:45

Small Group Discussions with Panelists

Hands-on Materials: Solar and Wind

FRIDAY, April 29, 1977

Consumerism and Conservation -- A Panel

Dianna Walworth, Florida Division of Consumer Services

Ted Duncan, Jr., Florida Petroleum Council

Dr. C. Hartley Melish, University of South Florida

Dialogue

Brown Bag Lunch: 11:45 to 12:15

Field Trip Lake Worth (FL) Power Plant
Claude L'Engle, Chief Engineer

THURSDAY, 6:00 - 9:00 PM, May 5, 1977

Designing Instructional Materials for Energy Education

Review of the Objectives for Energy Education

Models for Energy Education

Examples of Instructional Materials

Setting Functional Working Groups

Decision-making on a Common Model and Setting Group Goals

FRIDAY, 8:00 - 3:00, May 6, 1977

Demonstrations of Exemplary Instructional Materials

Bill Hammond, Lee County Environmental Education Project

Tom Baird, Pasco County Energy Management Center

Marjorie Ebersbach, Brevard County Center for Environmental Learning

Brown Bag Lunch: 12 to 12:45

Working Groups on Instructional Design

SATURDAY, 8:00-3:00, May 7, 1977

Working Groups all day

THURSDAY, 6:00 - 9:00 PM, May 12, 1977

Working Groups all evening

FRIDAY, 8:00 - 3:00, May 13, 1977

Working Groups all day - Optional Field Trip to the Riviera Beach Power Plant operated by the Florida Power & Light Company

SATURDAY, 8:00 - 3:00, May 14, 1977

Energy and Human Values: Panel

Peter A. Butzin, Director, Common Cause-Florida

Joseph Jenkins, Florida Public Service Commission

Rod Allen, Florida State University

Dialogue

Brown Bag Lunch: 12 to 12:45

Sharing of Instructional Material Products, Group Participants

Summative Evaluation of the Credit Institute

Rod Allen and David LaHart

Adjourn

MEDIA SUGGESTIONS FOR INSTITUTE PARTICIPANTS

ENERGY TO BURN. 20 minutes. color. sound. 16mm. Produced by King Screen Productions, for the Biological Sciences Curriculum Study Project. Available from BFA Educational Media, 2211 Michigan Avenue, Santa Monica, California 90404, or on loan from the Florida Office of Environmental Education, Knott Building, Tallahassee, FL 32304.

A BSCS issue-oriented inquiry film, ENERGY TO BURN is divided into sections which a teacher shows, stops the film, and conducts a discussion. Focused upon the current energy crisis, the film raises questions (rather than providing answers) about energy consumption, lifestyles built upon high energy, and our energy future. Highly recommended.

THE ENERGY DILEMMA: Critical Choices Ahead. 20 minutes. color, sound. 16mm Produced by Films, Inc., 8124 North Central Park Avenue, Skokie, Illinois 60076. Distributed by the U.S. Department of Commerce (Attn.: Lee Wyatt), Room 20-G, Collins Building, Tallahassee, FL 32304.

The film offers a fine overview of the conventional vision of the energy crisis. The main virtue of the film is the set of premises upon which its presentation and conclusions are based. Educators can use the film as an inquiry lesson in digging out and challenging those assumptions and implicit premises. Recommended.

SOLAR ENERGY: READY WHEN YOU ARE. 140 color slides and cassette tape. Produced by Southern Illinois University for the Federal Energy Administration. Available from the National Audio-Visual Center, General Services Administration, Washington, D.C. 20409 ($28.00) or on loan from Delbert Ward, Florida Solar Energy Center, State Road 401 Cape Canaveral, Florida 32920.

This slide-tape program is a superb introduction to the use of existing solar technology in homes ard public buildings. Recommended.

UP THE POWER CURVE. 10 minutes. color. sound. 16mm. Produced by the Federal Energy Administration. Available on free loan from Modern Talking Picture Service, 2323 New Hyde Park Road, New Hyde Park, New York 11040. #31484

This expository film opens with the problem of dependency on imported oil and the energy crisis as our "energy binge." It moves on to present various ways that the middle class citizen might save energy. The motive for saving energy is that of self-interest ("save money"). Teachers might use this with adult or school audiences as an introduction to energy conservation, as a springboard to creativity exercises on "Ways to Save Energy," or as a springboard to a consideration of the possible motives for energy conservation. Recommended.

CHALLENGE OF THE FUTURE. 28 minutes. color. sound. 16mm. Produced by the United States Energy Research and Development Administration. Available on free loan from Modern Talking Picture Service, 2323 New Hyde Park Road, New Hyde Park, New York 11040 #31217.

This expository film surveys the energy crisis in the United States and offers explanation in terms of supply and demand, moving to a survey of research developments holding promise for the future. It is a good introductory survey that, when coupled with provocative readings, will generate awareness and audience discussion. Recommended.

A MAN AND THE RIVER. 10 minutes, color. sound. 16mm. Produced by Randall Jesse for the Environmental Protection Agency. Available on free loan from Modern Talking Picture Service, 2323 New Hyde Park Road, New Hyde Park, New York 11040. #4944.

Set against brilliant footage of the Ozarks and Thomas Hart Benton's paintings, Randall Jesse chats and canoes with Thomas Hart Benton on the Buffalo River in the Ozarks. The topic of concern is the necessity of preserving free flowing wilderness rivers throughout the United States. Benton sets forth the arguments for such preservation in a relaxed dialogue with Jesse. Recommended.

MINES AND THE ENVIRONMENT: STRIKING A BALANCE. 15 minutes. color. sound. 16mm. Produced by the AMAX Coal Company. Available on free loan from the Modern Talking Picture Service, 2323 New Hyde Park Road, New Hyde Park, New York 11040. #30345.

The expository film offers the audience a view of one stripmining/reclamation effort in Indiana which has been in operation for twenty-five years. The process for strip mining coal and the process of land reclamation are described in relative flat terrain. The film is attractive, but the subject is one where over generalization is too easy. Indiana conditions are not West Virginia or Montana conditions. Not Recommended.

PEOPLE WITH A PURPOSE. 12 minutes. color. sound. 16mm. Produced by IBM Corporation. Available on free loan from Modern Talking Picture Service, 2323 New Hyde Park Road, New Hyde Park, New York 11040. #3377 This film focuses upon the motivation and curiosity of three scientists working on global problems--oceans, energy, and food. The personal and social rewards of human inquiry and industry are pointed out. This film may be useful to motivate students, to foster curiosity, and to lead into student inquiry on local aspects of global programs. Recommended.

CHOICE STAKES. 8 minutes. color. sound. animated. 16mm. Produced by Bryan Phillips and Associates for the U.S. Environmental Protection Agency. Available on free loan from Modern Talking Picture Service, 2323 New Hyde Park Road, New Hyde Park, New York 11040. #31006

This animated cartoon offers an impressionistic tale of human desire and technological power which forces viewers to reflect and to interpret. It is a superb springboard for class discussions of the root motives of environmental degradation in urban-industrial societies. Recommended.

CLEAN ENERGY FOR TODAY AND TOMORROW: The Role of Natural Gas. 28 minutes. color. sound. 16mm. Produced by the American Gas Association. Available on free loan from Modern Talking Picture Service, 2323 New Hyde Park Road, New Hyde Park, New York 11040. #9999-D

Narrated by Hugh Downs with a series of brief interviews, interspersed with energy use scenes, this film offers a range of facts about gas supplies, gas demands, and the future of gas as an energy source. The evil of government regulation (price controls) are set forth. The need for additional search for gas supplies and research into more efficient gas consumption and new sources of gas (coal gasification, LPG, etc.) is presented. In summary, the film offers an optimistic view of the future--assuming that government takes the "proper positions," Marginal.

ENERGY: IMPACT ON VALUES AND LIFESTYLES. 68 frame filmstrip and audio-cassette tape. Produced by and available from Current Affairs, 24 Danbury Road, Wilton, Connecticut 06897. Discussion guide included.

A good traditional view of the energy crisis and its impact upon present and future lifestyles is offered to viewers. Issues are raised: likely responses to conservation, energy vis-a-vis environmental protection, personal and corporate responsibilities, etc. Recommended.

THIS WORLD OF ENERGY. A kit of five filmstrips and audio-tapes. Produced by and available from The National Geographic Society, 17th & M Streets, NW, Washington, D.C. 20036

The filmstrip titles are: Energy in the Earth, Using Energy, Fossil Fuels, Nuclear Power, and Energy for the Future. The filmstrips are expository, but used in conjunction with readings and decision-making cases, they are very useful. Recommended.

FILMS RECOMMENDED TO THE PARTICIPANTS

THE ENERGY DILEMMA. 20 minutes. color. sound. 16mm. Produced by Films, Inc., 8124 North Central Park Avenue, Skokie, Illinois 60076. Distributed by the U.S. Department of Commerce, Room 20-G, Collins Building, Tallahassee, Florida 32304 (Attn: Lee Wyatt). RECOMMENDED - a superb introductory film.

ENERGY AND MATTER. 9 minutes. color. sound. 16mm. Produced by the National Film Board of Canada. Distributed by McGraw-Hill Text-Films, P.O. Box 590, Highstown, New Jersey 08520. RECOMMENDED.

LIVING WITH ENERGY. 26 minutes. color. sound. 16mm. Produced by Hanna Barbara Productions, Inc. for the Standard Oil Company of Indiana. Distributed by Extension Service, U.S. Department of Agriculture, College of Agriculture, University of Georgia, Athens, Georgia 30602. NOT RECOMMENDED.

PUTTING THE SUN TO WORK. 5 minutes. color. sound. 16mm. Distributed by the U.S. Energy Research and Development Administration, Film Library, P.O. Box 62, Oak Ridge, Tennessee 37830. RECOMMENDED.

HERE COMES THE SUN. 15 minutes. color. sound. 16mm. Distributed by the U.S. Energy Research and Development Administration, Film Library, P.O. Box 62, Oak Ridge, Tennessee 37830. RECOMMENDED.

TO BOTTLE THE SUN. 4 minutes, color, sound. 16mm. Distributed by the U.S. Energy Research and Development Administration, Film Library, P.O. Box 62, Oak Ridge, Tennessee 37830. RECOMMENDED.

POWER FROM THE EARTH. 12.5 minutes. color. sound. 16mm. Distributed by the U.S. Energy Research and Development Administration, Film Library, P.O. Box 62, Oak Ridge, Tennessee 37830. RECOMMENDED.

INTRODUCING ATOMS AND NUCLEAR ENERGY. 6 minutes. color. sound. 16mm. Produced by Coronet Films. Distributed by U.S. Energy Research and Development Administration, Film Library, P.O. Box 62, Oak Ridge, Tennessee 37830. OLDER FILM. MARGINAL.

A IS FOR ATOM. 8 minutes. color. sound. 16mm. Distributed by the U.S. Energy Research and Development Administration, Film Library, P.O. Box 62, Oak Ridge, Tennessee 37830. RECOMMENDED.

CONTROLLING ATOMIC ENERGY. 8 minutes. color. sound. 16mm. Distributed by the U.S. Energy Research and Development Administration, Film Library, P.O. Box 62, Oak Ridge, Tennessee 37830. RECOMMENDED.

TO IMMITATE THE SUN. 29 minutes. color. sound. 16mm. Distributed by the U.S. Energy Research and Development Administration, Film Library, P.O. Box 62, Oak Ridge, Tennessee 37830. RECOMMENDED.

KING ZOG AND THE ENERGY CRUNCH. 19 minutes. color. sound. 16mm. Distributed by the Unitary Heating and Cooling Section, Air-Conditioning and Refrigeration Institute, 1815 North Fort Meyer Drive, Arlington, Virginia 22209. RECOMMENDED.

ENERGY VS. ECOLOGY. 25 minutes. color. sound. 16mm. Produced by Allis-Chalmers. Distributed by Modern Talking Picture Service, Inc., 4705-F Bakers Ferry Road, Atlanta, Georgia 30336. RECOMMENDED.

THE THREE E's: ENERGY, ENVIRONMENT, AND ECONOMICS. 27 minutes. color. sound. 16mm. Produced by the Exxon Corporation. Distributed by J.P. Reidy, P.O. Box 420, Charlotte, North Carolina 28230. MARGINAL.

NATURE'S FORGE. 29 minutes. color. sound. 16mm. Distributed by the U.S. Energy Research and Development Administration, Film Library, P.O. Box 62, Oak Ridge, Tennessee 37830. RECOMMENDED.

THE FIRST TWENTY-FIVE YEARS. 28 minutes. color. sound. 16mm. Distributed by the U.S. Energy Research and Development Administration, Film Library, P.O. Box 62, Oak Ridge, Tennessee 37830. MARGINAL.

THE WEB OF LIFE: ENDLESS CHAIN. 28 minutes. color. sound. 16mm. Distributed by the U.S. Energy Research and Development Administration, Film Library, P.O. Box 62, Oak Ridge, Tennessee 37830. RECOMMENDED.

MATERIALS LIST

ENERGY AND THE ENVIRONMENT: CITIZENS' WORKSHOP HANDBOOK. Washington: ERDA, n.d.

ENERGY AND ENVIRONMENT: LEARNING ACTIVITIES FOR CAMP AND HOME. Tallahassee: Environmental Education Project, Florida State University, 1975.

ENERGY CONSERVATION: UNDERSTANDING AND ACTIVITIES FOR YOUNG PEOPLE. Washington: Office of Conservation Education, Federal Energy Administration, 1975.

HOW THINGS WORK. Maitland, Florida: Florida Audubon Society, 1975. Booklet to accompany slide-tape presentation.

THE ECONOMICS OF THE ENERGY PROBLEM. New York: Joint Council on Economic Education, 1975. Economic Topic Series.

THE ENERGY CRISIS: WHAT YOU CAN DO ABOUT IT. Chicago: Standard Oil of Indiana (MOBIL), 1975. Ditto Masters Kit.

ANNUAL REPORT TO THE LEGISLATURE, 1975-76. Tallahassee: The Florida Energy Office, 1976.

ENERGY ACTIVITY GUIDE. Arlington, Virginia: Energy Interpretation Project, National Recreation and Park Association (NRPA), 1975. Tabloid.

"How Safe is Nuclear Energy?", NEWSWEEK, 1976.

TEACHERS' GUIDE, THE ENVIRONMENTAL IMPACT OF ELECTRICAL POWER GENERATION: NUCLEAR AND FOSSIL. Harrisburg: Pennsylvania Department of Education, 1975. With the U.S. Energy Research and Development Administration, Washington, D.C.

THE ENVIRONMENTAL IMPACT OF ELECTRICAL POWER GENERATION: NUCLEAR AND FOSSIL. Harrisburg: Pennsylvania Department of Education, 1975. With the U.S. Energy Research and Development Administration, Washington, D.C.

ENERGY CONSERVATION CHECKLIST FOR BUILDERS AND HOMEBUYERS. Washington: Federal Energy Administration, n.d.

E.F. Schumacher, SMALL IS BEAUTIFUL: ECONOMICS AS IF PEOPLE MATTERED. New York: Harper & Row, 1973.

USING ENERGY WISELY. Jacksonville: Mayor's Energy Office, 1975. Packet of materials.

SAVE ENERGY, SAVE MONEY. Washington: Community Services Administration, 1975.

FLORIDA ENERGY ACTIVITIES. Tallahassee: Environmental Education Project, Florida State University, mimeographed, 1976.

ENERGY CONSERVATION: PROJECT RETRO-TECH (Teacher's Kit for Course on Home Winterization). Washington: Federal Energy Administration, 1975.

R.F. Allen, et al., DECIDING HOW TO LIVE ON SPACESHIP EARTH. Evanston, Illinois: McDougal, Littell Company, 1973.

ENERGY IN SOLID WASTE: A CITIZEN GUIDE TO SAVING. Washington: Citizens' Advisory Committee on Environmental Quality, 1975.

TIPS FOR ENERGY SAVERS. Washington: Federal Energy Administration, 1975.

A PLANNER'S HANDBOOK ON ENERGY. Tallahassee: Florida Energy Office, 1975.

COAL FACTS, 1974-1975. Washington: National Coal Association, 1975.

ENERGY MANAGEMENT CENTER, PASCO COUNTY (FLORIDA) SCHOOLS. Eight Units for High Schools.

THE SUN FOCUS (Solar Industries of Florida, Inc.), Summer, 1976 Issue.

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EXECUTIVE SUMMARY: ECONOMIC GROWTH IN THE FUTURE. New York: Edison Electric Institute, 1975.

THE FUTURE OF THE ELECTRIC UTILITIES. Washington: American Enterprise Institute, 1975.

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ENERGY AND ECOLOGY. South Norwalk, Connecticut: The Reading Laboratory, 1975. With Teacher's Guide.

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THE OFFSHORE ECOLOGY INVESTIGATION. Galveston, Texas: Gulf Universities Research Consortium, n.d.

FACTS ABOUT OIL. Washington: American Petroleum Institute, n.d.

QUESTIONS ANT ANSWERS ABOUT NUCLEAR ENERGY. Miami: Florida Power & Light Company, n.d.

THE SUN BELOW. Tallahassee: The Florida Petroleum Council, 1975.

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"Solar Heat Brightens Home," Tallahassee DEMOCRAT, March 21, 1976.

"Getting a Taste of Solar Energy," Washington POST, June 17, 1976.

ENERGY: A Schema Produced by the John Muir Institute for Environmental Studies, Berkeley, California.

SOLAR ENERGY, Shell Reports, January, 1976.

CREATING ENERGY CHOICES FOR THE FUTURE: HIGHLIGHTS FROM THE NATIONAL PLAN FOR ENERGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION. Washington: ERDA, 1975. 12pp.

A NATIONAL PLAN FOR ENERGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION: CREATING ENERGY CHOICES FOR THE FUTURE. Volume 1: The Plan. Washington: ERDA, 1976. 122pp.

A NATIONAL PLAN FOR ENERGY RESEARCH, DEVELOPMENT,AND DEMONSTRATION: CREATING ENERGY CHOICES FOR THE FUTURE. Washington: ERDA, 1975. 8pp.

1976 NATIONAL ENERGY OUTLOOK: EXECUTIVE SUMMARY. Washington: Federal Energy Administration, 1976. 14pp.

A FLORIDIAN'S GUIDE TO SOLAR ENERGY. Tallahassee: Florida Energy Office, 1976.

MINIATURE SOLAR WATER HEATER DEMONSTRATION UNIT. Cape Canaveral: Florida Solar Energy Center, 1976.

EXPLORING ENERGY CHOICES: A PRELIMINARY REPORT. New York: The Ford Foundation, 1974.

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MAKING THE MOST OF YOUR ENERGY DOLLARS IN HOME HEATING AND COOLING. Washington: National Bureau of Standards, n.d.

USING SCRAP IRON AND STEEL DOES MORE THAN REDUCE SOLID WASTE. Washington: Institute of Scrap Iron and Steel, n.d.

SCRAP IS NOT JUNK. Washington: Institute of Scrap Iron and Steel, n.d.

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MEDIA SUGGESTIONS FOR INSTITUTE PARTICIPANTS. Tallahassee: The Institute Staff, mimeographed, 1977.

4 STATES OK LIFELINE ELECTRIC RATES. Evening Journal(Wilmington, Delaware), July 7th, 1976, p.13.

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National Science Teachers Association Units:

Agriculture, Energy & Society (draft version)

Energy, Engines, and the Industrial Revolution (draft version)

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Energy: The Case for Conservation, WORLDWATCH PAPER #4 (January, 1976).

Q & A: NUCLEAR POWER AND THE ENVIRONMENT. Hinsdale, Illinois: The American Nuclear Society, 1976.

Hogerton, John F. NUCLEAR REACTORS. Oak Ridge, Tennessee: ERDA Technical Information Center, 1970. Revised edition.

Nuclear Energy: Do the Benefits Outweigh the Risks?, SKEPTIC, Number 14 (July-August, 1976). entire issue.

In addition, participants received a number of ERDA brochures and pamphlets, courtesy of the American Museum of Atomic Energy, Sheila Ronis, Education Director.

One-third of the participants received bottled samples of Florida crude oil, courtesy of the Florida Petroleum Council, Ted Duncan, Jr., Associate Director. One-third received model windmills for use with their classes. And one-third received solar fans for hands-on activities with their classes.

This list of resource materials omits many articles and items contributed by participants(and reprinted for distribution). This list also omits single copies of many instructional units which were available for participant examination in our meeting room, but which would have been too costly to reprint for each person to receive a copy.

In sum, this set of materials given to the participants is well-balanced on the issues involved in the energy crisis. While we attempted to obtain a variety of energy education materials which were written at a lower reading level, few are available. The teacher-written materials in Volume II of this Final Report will compensate for this weakness in published materials.

Participants in this institute also received copies of the lessons written by last year's ERDA Energy Education Credit Institute.

5. FORMATIVE EVALUATION

Formative evaluation enables the Institute staff to detect deficiencies and correct them before they seriously weaken the process of the institute. In addition to being a problem detection device, formative evaluation provides important feeback for the planning and execution of future eneavors with similar target groups.

The Institute staff devised a useful method of collecting information for this mid-stream correction. The formative evaluation instrument was administered to institute participants five times. The following summaries were made by the Institute staff after the instrument was administered, enabling problems identified to be corrected.

SESSION REACTION SHEET -- APRIL 25/26, 1977

1. How worthwhile has this session been for you personally?

	6	5	4	3	2	1	
Not very Worthwhile	0	0	0	4	20	8	Extremely Worthwhile

N 32

What made this worthwhile for you?

What limited its worth for you?

2. How clear were you about what you were supposed to be learning during this session?

	6	5	4	3	2	1	
Very Confused	0	0	2	10	15	5	Very Clear

N 32

What, in particular, did you find confusing or unclear?

3. How much audience participation took place in the discussion session?

	6	5	4	3	2	1	
Seemed to be Very Little	0	0	2	7	13	10	Seemed to be a Good Discussion

N 32

4. Additional comments and feedback:

25

Participant Comments:

"I would like to have Mr. Guttmann present a synopsis of his energy conservation course."

"I like the daily packets of materials. They provide an opportunity to gain some background before the workshop sessions."

"I think that this is a good beginning for myself toward valuable personal growth and the writing of some meaningful curriculum materials."

"This is a worthwhile workshop for informing the public about the energy crisis and things they can do to conserve and save the little fossil energy that we have left."

"We have a very good atmosphere, which is quite enjoyable."

"Workshop is well-organized, materials clearly prrsented in an organized, logical sequence. You'all is doin' a good job, fellas."

"The group discussion of energy goals for education was confusing to me and to others."

"There seem to be many conflicting views for the goals of energy education. I would like to have more discussion on goals."

"Most people are here because they are interested. We represent schools where little interest has been shown. More of these kinds of courses could be benefical."

"I realize the problem of scheduling, but the first day was really heavy! It was a good idea to have had more time for thinking and discussion on the second day."

Staff Conclusions:

1. Art Marshall's presentation had to be added to the first day due to personal commitments he had on Tuesday. This made the first day a heavy one. In the future, we will stay with the original plan.

2. In our effort not to impose goals and objectives on teachers, we did not adequately structure our presentation and their small group sessions on the goals of energy education in their schools and subject areas. We will return to goal setting later in the institute. But in the future, we need to carefully teach a set of Basic Energy Concepts, and then provide alternative sets of energy education goals for a more systematic consideration by teachers. This would still not give the impression that we are setting goals for them and their county curriculum!

SESSION REACTION SHEET -- APRIL 27/28, 1977

1. How worthwhile has this session been for you personally?

	6	5	4	3	2	1	
Not very Worthwhile	0	0	0	1	15	15	Extremely Worthwhile N 31

What made this worthwhile for you?

What limited its worth for you?

2. How clear were you about what you were supposed to be learning during this session?

	6	5	4	3	2	1	
Very Confused	0	0	0	1	16	15	Very Clear N 32

What, in particular, did you find confusing or unclear?

3. How much audience participation took place in the discussion session?

	6	5	4	3	2	1	
Seemed to be Very Little	0	0	0	4	15	12	Seemed to be a Good Discussion N 31

4. Additional comments and feedback:

Participant Comments:

"The various approaches of the speakers was superb. Their frankness as to the state of the art in nuclear and solar--Their ability to take criticism and have logical answers to many people's fears, real or not."

"The extent to which the speakers were willing to share ideas. Several had a remarkable backgrounds and experience. They really spelled out the problems and opportunities in nuclear energy."

"Everything was worthwhile!"

"Tremendous program."

"Most interesting two days of learning that I have ever had."

"Course has exceeded my expectations!"

"This workshop has been the most worthwhile experience I have had since I started teaching."

"Six hour days are too short. A seven or eight hour day would be better!"

Staff Conclusions:

1. In the future, we should replicate the solar and nuclear panels. The format and the speakers selected were very effective. Each participant was very positive and valued the two panels and the informal afternoon sessions.

2. We have no conclusion on the length of the day. Most participants seem to think that six hours of presentation and interaction are adequate to their entry abilities and to their attention span on technical matters.

SESSION REACTION SHEET -- APRIL 29, 1977

1. How worthwhile has this session been for you personally?

	6	5	4	3	2	1	
Not very Worthwhile	0	0	0	2	20	9	Extremely Worthwhile

N 31

What made this worthwhile for you?

What limited its worth for you?

2. How clear were you about what you were supposed to be learning during this session?

	6	5	4	3	2	1	
Very Confused	0	0	0	11	15	5	Very Clear

N 31

What, in particular, did you find confusing or unclear?

3. How much audience participation took place in the discussion session?

	6	5	4	3	2	1	
Seemed to be Very Little	0	0	0	0	20	11	Seemed to be a Good Discussion

N 31

4. Additional comments and feedback:

Participant Comments:

Participants experienced a morning panel on energy economics and conservation, followed by an afternoon field trip to a municipal power plant in Lake Worth, Florida -- Claude L'Engle, Chief Engineer.

1. "Appreciated the panel's advise on materials and strategies for teaching my classes."

2. "Power plant experience was worthwhile, especially the question and answer session with the chief engineer--very practical person with concrete answers."

3. "Consumerism speaker seemed to know little about energy."

4. "Power plant noise made communication there very limited until we went to the conference room."

5. Several participants noted the importance of thr brief presentations, with maximum time for asking their own questions ----as opposed to the more usual prepared speeches and activities from teacher education workshop leaders.

Staff Conclusions:

1. Once again this year, the field trip to the power plant (although optional) got mixed reactions. The most negative comments concerned the noise and the inability to get questions answered on the operating floor. The institute staff can do little about this! We do need a better briefing prior to the trip, focusing upon diagrams of the process--input to output.

2. Participants appreciated the constant diversity in speakers' views and the fairness (representativeness) of the panels and program.

3. At this point participants begin to focus on what they will write for their classes and how they might communicate and share with their colleagues back in their schools. All participants seemed convinced of the topic's importance in education and are thinking about broadening their personal impact on the curriculum.

SESSION REACTION SHEET — MAY 5-7, 1977

1. How worthwhile has this session been for you personally?

	6	5	4	3	2	1	
Not very Worthwhile	0	1	2	6	10	11	Extremely Worthwhile

N 30

What made this worthwhile for you?

What limited its worth for you?

2. How clear were you about what you were supposed to be learning during this session?

	6	5	4	3	2	1	
Very Confused	1	0	5	2	12	10	Very Clear

N 30

What, in particular, did you find confusing or unclear?

3. How much audience participation took place in the discussion session?

	6	5	4	3	2	1	
Seemed to be Very Little	0	1	1	5	9	14	Seemed to be a Good Discussion

N 30

4. Additional comments and feedback:

Participant Comments:

These sessions evaluated in this report opened with presentations of various energy education materials and instructional strategies, and moved to participants forming groups, setting goals, and selecting a format for the materials produced. Some confusion and anxiety is to be expected. From serving as active listeners to new ideas, the participatants are forced to direct their own activities --with a product expected within a set time frame and a product that is to be shared with the entire group!

1. "Suggest more brainstorming on the format and goals for lessons before breaking into small groups."

2. "We liked the freedom to put together what we know and the openness of the directions and demands made upon us."

3. "We wanted more specific directions on lesson plans."

4. "I really appeciated the opportunity to hear and to talk with persons who had written materials--very useful materials."

5. "Allowing time for interdisciplinary sharing was great! I picked up a lot of ideas."

6. "I really enjoy this workshop and my students seem fascinated by what I bring back to them and they want more. I can't seem to talk enough about this workshop back in my school. I have set up a sharing file in the faculty room to let teachers discover more about what we are doing and to help them in their teaching."

7. "We really like the emphasis upon writing materials which we will use. Not materials to meet someone else's criteria, ideals, or format!"

Staff Conclusions:

1. The participants were elated with Tom Baird's presentation and materials. We will build on this next time. Unfortunately, the ERDA -produced teaching units arrived too late to be used. They will be mailed to all participants.

2. Some teachers wanted more direction but most were pleased with openness. We will continue this method of operation, especially since the university-based project staff has no business telling(or suggesting) who teachers and school staff how they should teach or organize instruction.

6. SUMMATIVE EVALUATION: U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION FORM

Formal summative evaluation of the credit institute was provided with two evaluative instruments. One instrument was supplied by ERDA and the completed forms were sent to ERDA's Washington office. The data are summarized below. A second instrument was developed by the Project staff and the data are summarized in Section 7 of this final report.

FORM ERDA-401 (3-77) U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

ERDA FACULTY DEVELOPMENT WORKSHOP EVALUATION

Institution _____

Date _____

The purpose of this questionnaire is to obtain your evaluation of the particular workshop which you have attended, and also to help ERDA assess the effectiveness of its national program of energy workshops.

1. In general, the program content was (circle one):

excellent (29) good (5) fair (0) poor (0)

2. In general, the quality of presentations was:

excellent (27) good (7) fair (0) poor (0)

3. Your objectives in attending this workshop were:

See attached sheet

4. The extent to which you achieved your objectives was:

achievement (33) part achievement (1) failure (0)

5. If this workshop dealt with controversial national issues, did the workshop attempt to present both sides of an issue?

Yes (34) No (0) Not Applicable (0)

6. Would you recommend participation in this workshop to a colleague?

Yes (34) No (0)

7. Briefly state your plans for changes in your courses as a result of this workshop.

   See attached sheets.

8. In your opinion, what is the probability of significant long-term benefits to your teaching as a result of this workshop?

   High (32) Medium (2) Low (0)

9. Please make any suggestions for future workshops on this or related topics.

   See attached sheets.

Participant Reactions on Question #3:

--Gain a basic knowledge of energy, the energy crisis, and related concepts
--Personal educational/professional development
--Bring back to my faculty sources which they can use to teach better about energy
--Gather and incorporate useful current information about energy in my teaching
--Get credit for teaching certificate extension
--Acquire lesson plans to be used in my classroom
--Develop teaching techniques for energy education
--Interact with resource people who are dealing with research into energy production and conservation
--Get insight into the energy situation to set up an energy program in my school
--Get an opportunity to organize and produce lesson materials for my classes
--Test my personal knowledge of energy and energy issues, while learning more for my personal development
--Learn alternative ways to "solve" the energy crisis

Participant Reactions to Question #7:

--I will increase my emphasis upon energy conservation.
--I intend to extend the development of the purely scientific concept of energy in my physics course--it has a historical approach anyway(Project Physics)— to include some consideration of the use of energy sources through history and in present lifestyles, etc.
--I see my work as a resource teacher in the school to help all departments develop energy related studies in these departments.
--I will include lessons on energy in social studies classes which I now teach. This institute has given me the material I needed.
--I have introduced a two-week mini-unit on Energy Consciousness" into my consumer education course. Goal: To involve entire student body in energy conservation in the school.
--I have for several years tried my courses into energy studies. I will now write a school-wide program with my teaching team.

--I hope to merge an industrial arts class and a science class for energy education in an attempt to bring concrete data and hands-on activities into student learning.
--Try to integrate ecology and energy in science courses and link that to debate and economics courses in other departments.
--I intend to add a two-week unit on energy into my science program.
--Build in units where students make value decisions concerning energy alternatives.
--OK. Now I can teach in a knowledgeable fashion about the energy crisis. I was interested before, but very inadequately prepared to teach about the energy situation.
--Instead of talking at my students on energy, the workshop has motivated me to plan more "doing activities" for the students, more debating among the students, and more awareness of the issues.

Participant Reactions to Question # 9:

--I'd like to see more involvement by vocational education teachers.
--Two teachers reported that summer would be a better time for such workshops, since leaving school on a released time basis disrupts the students' course work. However, two teachers reported that they laked the released time aspect. The remainder of the teachers did not mention the timeframe for the workshop.
--We need more such opportunities for all teachers.
--In the future,use the same format. It worked well! (several teachers reinforced this comment)
--We need workshops of this caliber for home economists. We need mini-workshops at community centers for community leaders and adults in all walks of life.
--We need more workshops which offer graduate credit.
--Try a workshop focused on a school faculty, and follow up at regular intervals to assess the impact.
--More work needs to be accomplished for lower grade level teachers --K-8. (several teachers mentioned this need)
--Visit a community place using alternative energy sources.
--Provide more hands-on, demonstration materials for every participant.
--In the next workshop, use some of us from this workshop as participant/leaders. We could continue to build on what was accomplished in this Institute.
--The only suggestion I have is to make more workshops available to us. I would be willing to pay for the chance of attending energy workshops. I can relate much more to energy education through a workshop like this than to a course given at a University. As an aid to education, this workshop has been more than any course in education.
--I would like to see more hardware demonstrated, such as solar collectors, stora storeage batteries, windmills, etc.
--We need follow-up opportunities. The level we have rsached is not an end in itself. The effort made so far is in large measure wasted if the participants are dropped at this point.
--Schedule the workshops earlier in the school year.

SUMMATIVE EVALUATION: INSTITUTE STAFF FORM

The second summative evaluation instrument was developed by the Florida State University Institute staff to provide an instrument that would allow for easy summary of data and yet give participants enough latitude to make constructive comments. This instrument has proven reliable as an evaluation tool during a variety of workshops and with a variety of workshop participants.

Both evaluation instruments collected positive data regarding the entire Institute, the format and the content. Data for this Institute was collected and summarized by the Institute staff.

FINAL QUESTIONNAIRE

NAME _____ DATE _____

1. To what extent has this program fulfilled your expectations about what you personally might get out of it?

	6	5	4	3	2	1	
Has not come up to my expectations	0	1	0	2	10	17	Has exceeded my expectations

N=30

a) What exactly has happened that brings you to this conclusion?

2. Think for a moment about the presentations and discussions in this program. All in all, how would you rate them? (CHECK ONE BOX IN EACH LINE).

	6	5	4	3	2	1	
Only restated or proved what I already knew	0	0	1	1	15	13	Offered new insights, new ways of viewing old problems

N=30

	6	5	4	3	2	1	
Missed the important issues, vital concerns	0	0	0	0	7	23	Spoke to important issues, vital concerns

N=30

	6	5	4	3	2	1	
Clear, understandable	19	6	5	0	0	0	Hard to understand, complex, full of "jargon"

N=30

	6	5	4	3	2	1	
Wasn't very useful for understanding today's issues	0	0	0	3	2	25	Provided useful insights of today's issues

N=30

3. Where there any points in the program where you had a feeling of sudden insight, of really knowing what it was all about (an "Ah-ha")?

12 No, I was always pretty clear.

1 No, I'm still in a bit of a muddle.

17 Yes. What in particular triggered the insight(s)? Participants identified the panel discussions, Art Marshall, and the emphasis on energy as a moral and ethical crisis a- being most helpful.

4. Were there any points in the program where you had a feeling of complete confusion and/or frustration?

15 No, I felt almost no confusion or frustration.

7 No, any confusion or frustration was cleared up pretty quickly.

8 Yes. What in particular led to that feeling? Some teachers expressed frustration with the heavy science concepts and wanted the staff to provide a format for their curriculum. They most often identified our regular review of goals as the way frustration was resolved. Those few (3) participants who still felt frustration did so "because there were no clear answers to the energy crisis."

Has the confusion or frustration been resolved?

27 Yes, how?

3 No.

5. People attend workshops and courses for a variety of reasons. Please check honestly any of the following reasons that apply to you, and CIRCLE the checkmark of the reasons which were MOST IMPORTANT in your decision to attend.

1 Many others in my group were attending.

4 My superiors suggested I go.

7 I was invited.

5. Continued

15 My superiors gave me the opportunity to go.

5 I was selected to attend.

1 My attendance was paid for.

22 I came because I really wanted to learn.

0 I'd heard _____

12 I had a particular need to deal with and thought this program would help me.

5 Other (Be specific) Five persons identified graduate credit as a partial motive for participating in the Institute

_____

6. Now that the program is over, how would you sum up the experience?

	6	5	4	3	2	1	
Not very worthwhile				1	7	22	Extremely worthwhile

Major factors contributing to your assessment:

Panel discussions 5
Resources & Materials 4
Curriculum Development 6
Learned both sides of issues 4
Open-ended discussions and approach to workshop 5
Penersonal awareness 3
Released time during school to learn 3

7. RECOMMENDATIONS AND CONCLUSIONS

A. Selection of Participants. This year the host school district chose the participants with guidelines from ERDA and from our proposal to ERDA. We obtained a very fine group of participants who were excellent classroom teachers and who were interested in improving the quality of instruction dealing with energy issues. In future, institutes the staff will work more closely with the host district to insure adequate representation of all target disciplines (e.g., home economics and social studies were slightly under represented this year).

B. Selection of Consultants. Most of this year's consultants received very positive responses from the participants. Those consultants who expressed obvious bias received higher praise than those who tried to be "objective." Objectivity was achieved on the panels by selecting consultants who represented diverse points of view.

The use of consultants who are on State budget lines(in the University system) and who are paid small honoraria still present an administrative problem. The administrative proceedures for reembursing and rewarding overload assignments are crude, inefficient, and very time consuming. The temptation is to pass over very qualified speakers from the State University System and import talent from out-of-state, simply to save the bureaucratic hassle! This is a problem area which the Institute staff cannot correct but has brought to the attention of University "leaders" on many occasions.

C. Selection of Host District. A greater selection of participants is available from the larger school districts and the overall impact of the Institute is undoubtedly greater. Future institutes will be targeted to large urban areas, like Palm Beach County. We will also try to involve selected participants from small rural counties, bordering on those urban districts, to foster diversity among the participants.

D. Timing and Format. Unquestionably, the teachers enjoyed the "week-on," "week-off,""week-on" format of this year's Institute. The released time with substitutes was favored by a majority of the participants. We will continue to use this format with minor modifications. Many participants felt that an early fall Institute would be better so that participants could maintain their momentum and integrate energy education topics and content during the year.

The most important contribution of the week-on,week-off,week-on format is the fact that it allows for greater incubation for creative lesson plan design. Teachers have a week back in school with their students to reflect upon what they have learned and what would be most effective with their students.

E. The Writing Time Component. The participants enjoyed the time to write their own instructional materials. In the original program we scheduled more time for writing at the Institute location than was necessary. We cut the two Thursday night meetings and participants gathered with their groups at times which were convenient for the group members. This was very productive and saved travel time and energy, as the groups were clustered geographically. Most groups actually put in more time together than was originally scheduled. In the future, we should keep the curriculum writing time flexible.

F. Final Panel. The final panel on "Energy and Human Values" was anti-climatic at that Saturday AM time. Participants wanted to learn from the panel, but also to share their materials. In the future we will begin the second week with a similar panel, and not close the Institute with it. (Teachers could then use the insights from the panel in their materials design).

G. Mail out Initial Packet of Materials. Because of the heavy volume of materials given to participants and the diverse entry abilities and interests, it would be better to mail an original small packet of readings to each person before the first meeting. This year we tried this, but the time between participant selection and the first meeting did not give the US Postal Service time to get the materials in Packet #1 from Tallahassee to West Palm Beach!

APPENDIX A: PUBLICITY

This section contains the publicity materials sent to school leaders, a few of the announcements which appeared in state and national publications, and the pre-Institute materials sent to applicants.

The cooperation of the Florida Office of Environmental Education, its director and regional consultants, was essential to the superb publicity which we received and which helped us to recruit such outstanding participants.

ENERGY EDUCATION WORKSHOP

The Environmental Education Project, Florida State University and the Palm Beach County Schools will conduct a credit institute for 35 high school teachers in late April and early May. The workshop focus will be upon energy concepts, broadly based facts regarding energy resource alternatives, energy conservation and teaching strategies for use in secondary schools. This workshop is funded by the U.S. Energy Research and Development Administration, (ERDA).

Eligibility: Secondary teachers with backgrounds in science, social studies, home economics, vocational education, consumer education and environmental education are invited to apply.

Where: The workshop sessions will be held at the South Technical Education Center, 1300 S.W. 30 Avenue, Boynton Beach, Florida 33435.

When: The content portion of the workshop will be April 25-29 from 8:30 to 3:30 pm. Curriculum development phases of the workshop will begin Thursday evening May 5, all day May 6 and 7 and Thursday, May 12, all day May 13 and 14.

Credit: Successful applicants will receive 4 hours of graduate credit for IDC 590: Field Experience. There is a $14.20 fee for credit, but graduate credit is optional.

Instructors: Rodney F. Allen and David E. LaHart, Florida State University, and a series of key energy researchers in Florida.

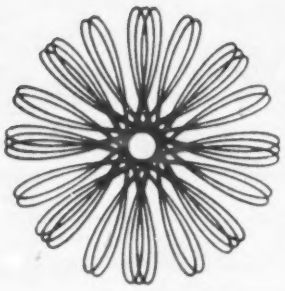
For additional information
and application forms, please
contact:

Your school principal or
Dr. John Thurber
(305) 683-0050

"In selecting individuals for participation and otherwise in the administration of this program Florida State University will not discriminate on the grounds of the race, creed, sex, color, or national origin of any applicant."

Since space is limited, there will be approximately one applicant accepted per school.

ENERGY EDUCATION CREDIT INSTITUTE VOLUNTEER APPLICATION FORM



I wish to volunteer for the Energy Education Credit Institute:

Applicant's Name _____

Home Address _____

_____, _____zip_____

Home Phone (AC) _____-_____ Social Security # _____-____-_____

High School Name _____

Address _____

_____ zip _____

Phone (AC_____) _____-_____

Male* [ ] Female* [ ] White* [ ] Black* [ ] Other* [ ]_____

(* Information needed for Federal Funding Agency)

Subjects Taught 1976-77	Grade Level

Participants in the credit institute agree to attend all sessions:

Monday through Friday, April 25 to 29th 8:30AM to 3:30PM
Thursday evening,May 5 6:00 to 9:00PM
Friday and SAturday, May 6-7 8:30AM to 3;30PM
Thursday, May 12 6:00 to 9:00PM
Friday and Saturday, May 13-14 8:30AM to 3:30PM

Graduate credit will be available to participants (IDC 590- Field Experience 4 graduate hours credit). All fees are waived except the $3.55 per hour "civic center and building fund fee" mandated by the State legislature. Thus, the cost for four graduate hours will be $14.20. Graduate credit is an option, and participants will decide whether to register for credit.

Where there are more volunteers than positions, the school principal will nominate a person and a first alternate in order to allow for Federally suggested balance of sex and race.

Attach a two paragraph statement on how participation in the credit institute will benefit your teaching program. Then, return the completed application to the principal of your school.

_____ _____

Applicant's Signature

Principal's Signature

__/ recommended participant
__/ first alternate

SELECTION OF WORKSHOP PARTICIPANTS

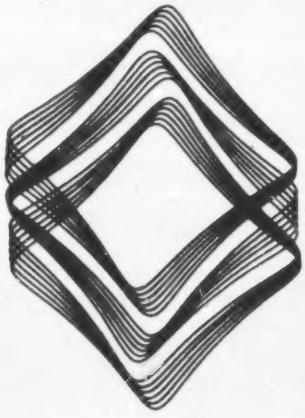
Administrative personnel of the Palm Beach County School System will select the participants for this credit institute. They will select from high school teachers of science, social studies, vocational education, environmental education, and home economics, employing the following criteria:

a) support of teachers' school principals and school district administrative staff;

b) distribution so as to involve as many schools as possible in an area;

c) distribution to achieve involvement on a sex, racial, ethnic balance; and

d) distribution to achieve a balance in curriculum areas (science, social studies, environmental education, vocational education, and home economics.)



ENERGY

ENERGY EDUCATION CREDIT INSTITUTE
FOR SECONDARY SCHOOL TEACHERS

FUNDED BY THE UNITED STATES ENERGY
RESEARCH AND DEVELOPMENT ADMINISTRATION

CONDUCTED BY THE ENVIRONMENTAL EDUCATION
PROJECT, FLORIDA STATE UNIVERSITY,
TALLAHASSEE

Rodney F. Allen
David E. LaHart

426 Hull Drive
Florida State University
Tallahassee, FL 32306
(904) 644-5769

April 25 - 29, 1977
May 5 - 7, 1977
May 12 - 14, 1977

South Technical Education Center
1300 S.W. 30th Avenue
Boynton Beach, Florida 33435

FLORIDA

ENERGY CREDIT INSTITUTE

Funded by the United States Energy Research and Development Administration

Sponsored by the Florida State University and the Palm Beach County Schools

MONDAY * April 25, 1977

Coffee**

Welcome, C. Richard Tillis, Director, Florida Office of Environmental Education

Frank Kapp, Consultant, Florida Office of Environmental Education

Don Chenicek, Energy Management Specialist, Palm Beach County Schools

Institute Overview and Objectives for Energy Education

David LaHart, Florida State University

Concurrent Sessions: 10:00 to 12:00

Group A: Citizens' Energy Workshop

Jerry Ventre, Florida Technological University

Group B: The National Energy Outlook

Rod Allen, Florida State University

Brown Bag Lunch: 12:00 to 12:45

Concurrent Sessions: 12:45 to 2:45

Group A: The National Energy Outlook

Rod Allen

Group B: Citizens' Energy Workshop

Jerry Ventre

* All sessions will begin at 8:30 AM and close at 3:00 PM.
** Bring your own mug, we will chip in for coffee and tea, as the participants prefer.

TUESDAY, April 26, 1977

The Florida Energy Outlook

Carlos Warren, Director, The Florida Energy Office

Rosalyn Tillis, Education Consultant, The Florida Energy Office

Oil, Natural Gas, and Coal in Florida's Energy Picture

Carlos Warren

Dialogue

Brown Bag Lunch: 11:30 to 12:15

Energy Flow in Natural and Human Systems

Arthur R. Marshall

Dialogue

WEDNESDAY, April 27, 1977

Nuclear Energy: Concepts, Processes and Issues -- A Panel

Moderator - David LaHart

Raymond Sheline, Florida State University

Robert Touchton, Westinghouse Electric, Pittsburgh

J.H. "Jack" Francis, Florida Power and Light Company

David Anthony, University of Florida

Brown Bag Lunch: 12:00 to 12:45

Small Group Discussions with Panelists

THURSDAY, April 28, 1977

Solar Energy: Concepts, Processes, and Issues -- A Panel

Del Ward, Florida Solar Energy Center, Cape Canaveral

Dr. Sheila Ronis, Museum of Atomic Energy, Oak Ridge, Tennessee

Robert Pozzo, Florida Energy Office

Dialogue

Brown Bag Lunch: 12 to 12:45

Small Group Discussions with Panelists

Hands-on Materials: Solar and Wind

FRIDAY, April 29, 1977

Consumerism and Conservation -- A Panel

Lee Rumbley, Florida Division of Consumer Services

Ted Duncan, Florida Petroleum Council

R. Terry Lyle, Executive Director,
Florida Council on Economic Education,
Clearwater

Dialogue

Brown Bag Lunch: 11:45 to 12:15

Field Trip

THURSDAY, 6:00 - 9:00 PM, May 5, 1977

Designing Instructional Materials for Energy Education

Review of the Objectives for Energy Education

Models for Energy Education

Examples of Instructional Materials

Setting Functional Working Groups

Decision-making on a Common Model and Setting Group Goals

FRIDAY, 8:00 - 3:00, May 6, 1977

Demonstrations of Exemplary Instructional Materials

Bill Hammond, Lee County Environmental Education Project

Tom Baird, Pasco County Energy Management Center

Marjorie Ebersbach, Brevard County Center for Environmental Learning

Brown Bag Lunch: 12 to 12:45

Working Groups on Instructional Design

SATURDAY, 8:00-3:00, May 7, 1977

Working Groups all day

THURSDAY, 6:00 - 9:00 PM, May 12, 1977

Working Groups all evening

FRIDAY, 8:00 - 3:00, May 13, 1977

Working Groups all day

SATURDAY, 8:00 - 3:00, May 14, 1977

Energy and Human Values: Panel

Peter A. Butzin, Director, Common Cause-Florida

Joseph Jenkins, Florida Public Service Commission

Rod Allen, Florida State University

Dialogue

Brown Bag Lunch: 12 to 12:45

Sharing of Instructional Material Products, Group Participants

Summative Evaluation of the Credit Institute

Rod Allen and David LaHart

Adjourn

College of Education
Division of Instructional
Design and Personnel
Development
Program of Science and
Human Affairs
Science Education
Social Studies Education

The Florida State University
Tallahassee, Florida 32306

June 10, 1977

Dear Workshop Participant:

I am enclosing Volume II of our Final Report that contains the energy education units and activities developed by workshop participants. I am certain you will find the Volume valuable in your energy education efforts this coming year. The final evaluation of the Volume and the entire workshop will depend on the usefulness of these units. Of course, any feedback you can offer is most welcome.

Rod and I sincerely enjoyed working with you this spring. We learned a lot -- and hope you did too.

If we can help you or your school in the future, please contact us.

Sincerely,

Dave

David E. LeHart

Rod

Rodney F. Allen

RFA:eg
Encl.

P.S. Those of you who took IDC 590 for credit should be receiving grade forms from the FSU registrar in August. If you have any questions about this, please contact Ms. Blanche McMullen, Division of Summer Sessions and Continuing Education, 200 Hecht House, FSU, Tallahassee, FL 32306 (904) 644-3806.